



CIRM Shared Research Laboratory Information Form – Part Two

Section A. Project Information

Project Title **The University of California: Irvine Regional Human Embryonic Stem Cell Shared Research Laboratory and Stem Cell Techniques Course**

Limited to 300 Characters

Project Start Date **Aug 1, 2007**

Construction Start Date **Jan 16, 2008**

Occupancy Date **Apr 2, 2008**

Total Part Two Funds Requested for Shared Laboratory Space **\$1,842,714**

Total Part Two Funds Requested for Stem Cell Techniques Course **\$ 499,265**

Total Capital Funds Requested **\$ 842,840**

Note: All green fields are calculated values. Do not enter a value in the field.

Please indicate whether you propose to apply for funding of a Stem Cell Techniques Course along with the Shared Laboratory Space, or just the Shared Laboratory Space.

☐ Shared Research Laboratory only

☒ Shared Research Laboratory and Stem Cell Techniques Course

NOTE: Please be aware that any information you provide in this form will be made publically available.

Section A. 1. Program Director

Name	Professor	Peter	J.	Donovan	
	Prefix	First	Middle	Last	Suffix
Email (office)	pdonovan@uci.edu			This email address identifies you to CIRM. Please use this email address for all correspondence with CIRM.	
Application Number	CL1-00520-1			This field should fill automatically, based on the email address. If not, enter the number you received via email from CIRM, in the form "XX9-99999-9", where "X" is a letter, and "9" is a digit.	

Section A. 2. Facilities Contact

Name	Ms.	Janet	C.	Mason	
	Prefix	First	Middle	Last	Suffix
Institution	University of California, Irvine				If your institution is not listed, please identify the name of the institution here.
Other Institution					
Position Title	Director				
Department	Capital Planning				
Address	750 University Tower				
City	Irvine			CA	Zip Code 92697-4535
Phone Number	(949) 824-7668		Ext	Fax Number (949) 824-2145	
Email (office)	jcmason@uci.edu			This email address identifies you to CIRM. Please use this email address for all correspondence with CIRM.	



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Section A. 3. Public Abstract

See Appendix A.

Section A. 4. Statement of Benefit to California

See Appendix A.



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Section B. Laboratory Renovation Plan

Project Manager	Ronald M. Hooven/Don Gaw	Construction Supervisor	Heather Frayer/Don Gaw
Title	Assoc.Dir, Asset Mgmt/Project Svcs, Fac	Title	Arch. Svcs, Dir/Proj. Svcs. Mgr.
Company/Institution	University of California, Irvine	Company/Institution	Casco Contractors/UC Irvine

Describe plans for development/renovation of the shared laboratory space including fixed equipment costs. Include a description of the current space and how it will be renovated and reconfigured to form the laboratory. Include as attachments one 11x17 page of the current floor plan space and one 11x17 page of proposed floor plan of the renovated space. Describe all renovations that will be done. Describe how the project will be managed and tracked, as well as how change orders will be handled. For laboratories that are proposed to be located in leased space, provide information regarding the institution's long-term access to the leased space. Describe plans and schedule for all phases of development including design, construction, and installation of equipment leading to a functional laboratory. Give a proposed contingency plan in case of cost overruns. Any additional costs due to budget overruns will be the responsibility of the grant recipient. (narrative limited to 3 pages)

PROJECT DESCRIPTION: The Sue and Bill Gross Stem Cell Research Center (the Center), which houses the SRL, is currently located at 101 Theory, a leased building in The Irvine Company's University Research Park (URP) immediately adjacent to UCI's Health Sciences complex. The space is completely free of federal funding allowing both derivation of, and work with, non-NIH-registered hESC lines. The SRL currently occupies about 25% of the Center's space and consists of 2 tissue culture rooms (550 sf total), an embryo culture/hESC derivation room (200 sf), a flow cytometry room with a BD flow cytometer (150 sf), an imaging room with a Zeiss two-photon confocal microscope (300 sf), a cryostorage room (250 sf), and general lab space with standard lab benches (1,100 sq ft). The Center also includes bench space for individual investigators, offices for the Program Director and Center administrators, a lecture room accommodating 15 people and a small meeting room. This application proposes renovation of existing SRL space and additional space within the Center to provide much needed expansion and improvements to tissue culture space (300 sf). We also propose minor, but critical, expansion of the seminar/teaching room to accommodate larger groups and reconfiguration of the Center entrance to improve security. In addition, we propose renovation of about 1788 sf of vivarium space, already assigned to the Center by UCI administration, to provide space for researchers from both UCI and our partners UC Riverside (UCR) (see Attached letter of agreement) and other eligible regional institutions) to both learn and carry out pre-clinical animal modeling of cell-based therapies. These renovations will maintain and expand the research and training efforts of the SRL in a federal funding-free environment (see Attachment B UCISRLCORE).

SHARED RESEARCH LAB RENOVATION - PROJECT DESCRIPTION

To create an additional tissue culture training laboratory in room 129, which is currently a storage area, we propose to seal the opening between that room and room 118, purchase and install tissue culture hoods and tissue culture incubators. The room will also be equipped with refrigerators and freezers, a tissue culture microscope equipped for fluorescence optics and a small centrifuge. This room, and each of the existing tissue culture rooms, will be equipped with HEPA filters over the air vents to improve sterility and card readers on the doors to restrict and monitor entry. A door will be installed in the opening to room 128 to provide additional security. Electrical upgrades in these areas will include new lighting, dedicated receptacles, and circuits to accommodate the HEPA filters and UPS power systems. Improved ventilation will be installed in rooms 117 (phone, server and security monitoring closet) and 118 (confocal) to alleviate heat buildup. To enhance our ability to hold classes, advisory board meetings, oversight committee meetings, patient advocate meetings as well as to further public outreach activities, we propose to create a larger conference room by demolishing the wall between room 103 and 104. A portion of the reception area (Room 102) will be enclosed to create an office to house the FAX, copier and administrative storage area. The present administrative storage area (room 112) will then become SRL space and have a door added to be utilized as a much-needed laboratory stock room storage. The wall between room 113 and 114 will be moved to create an entry that will allow a higher level of security for monitoring personnel entering the laboratory. In addition to these renovations, we plan to purchase other equipment to expand the capabilities of the SRL as follows:

(1) a BD FACSaria Cell Sorter: for isolation of purified populations of stem cells and differentiated derivatives. (2) an Amaxa nucleofactor: to allow investigators to achieve high-efficiency gene transduction of hESCs (3) an Autoclave: to sterilize instruments and other equipment to avoid having to use other facilities and/or use disposable plastics, (4) a dedicated server: for storage of investigator-generated data, (5) UPS backup power systems: to provide power to freezers and incubators in the event of power-outages, (6) a spectrophotometer: for quantification of DNA, RNA and protein concentrations of samples isolated from hESCs, (7) a nucleocounter: for determining cell numbers rapidly and with high efficiency (8) a gel doc system: for documentation of gels, Western blots, etc. (9) an Axiovert microscope: for analysis and documentation of fluorescence and histochemical staining of stem cells, differentiated cells derived from stem cells and stem cell-derived tumors (10) a dissecting microscope equipped with fluorescence optics to enable selection of fluorescently-labeled hESC colonies and analysis of tumors, (11) a tissue culture hood for investigator use for culturing hESCs, (12) a pair of tissue culture incubators for investigator use for culturing hESCs and



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Section B -- 1. Laboratory Renovation Plan (continued)

(13) a UPS power backup system to maintain the incubators in the event of a power failure.

PROJECT MANAGEMENT AND TRACKING

Because the building is leased, the project manager will be Ron Hooven from UCI's Campus Asset Management office. Mr. Hooven is responsible for negotiating and overseeing campus leases, and has supervised many tenant improvement projects in the University Research Park (URP). The construction supervisor will be Heather Frayer, of Casco Contractors, Inc. During construction, a construction manager representing the building owner will be on the job full-time to supervise the work, and progress will be tracked against the project schedule and reported to the campus project manager at weekly job meetings. Change order requests to address unforeseen conditions will be reviewed and approved by the project manager. Programmatic change orders would require the approval of executive management is required.

IMPLEMENTATION AND SCHEDULE

The project will be implemented using a design-build delivery system, with Casco Contractors as the firm selected jointly by The Irvine Company and UCI to perform the work. Casco is very familiar with the structures and building systems of the URP, and the associated costs for renovating them. They have an excellent track record for completing this type of project on schedule and on budget, and have worked on many URP projects for UCI and other tenants. Prior to submission of this grant proposal, Casco prepared a detailed plan and cost estimate for the project. Upon award of the grant, Casco will be authorized to prepare complete design documents, which will be reviewed and approved by the campus project manager and the users, and will undergo City of Irvine plan check. Completion of design documents, including the required reviews, is anticipated to take six weeks. Once the vivarium project has also completed design, both projects will be submitted to CIRM for approval of construction funding. When these funds are available, the approved construction documents will go to Casco's pre-selected sub-contractors for bid, and UCI's project manager will review and approve the bids before the construction contract is awarded. If the bids exceed the budget, changes will be considered that have a minimal impact on the overall function of the space. Bid and award are scheduled for two weeks. Construction, including installation of fixed equipment, is scheduled for five weeks. Once the timing of renovations has been determined, movable equipment will be purchased so that it arrives at the appropriate time to be installed immediately upon completion of the renovations. Because some of the large pieces of equipment have long lead times for delivery we plan to determine delivery schedules as soon as the proposal is funded and purchase equipment accordingly. Space in the SRL can accommodate large pieces of equipment should some of it need to be stored pending completion of the renovated space. In the event of cost overruns during construction, the additional costs would be the responsibility of the Sue and Bill Gross Stem Cell Research Center.

COST CONTROL STRATEGIES

The architect's design team will provide cost estimates at several milestones in the project, including the completion of preliminary plans and at 80% and 100% of working drawings. If at any point, estimates exceed the budget, changes will be considered that have a minimal impact on the overall function of the space, such as a reduction in the amount of cabinetry. In addition, the bid will include several alternates to provide flexibility in dealing with bid uncertainties. In the unlikely event of cost overruns during construction, the additional costs would be the responsibility of the Sue and Bill Gross Stem Cell Research Center.

ACCESS TO LEASED SPACE

The Center has been in its current location for about one year, on a lease that runs through March 31, 2009. This is the first lease that UCI has had on that particular lab space but the campus has leased other space in the same building since 2001. There are no ongoing negotiations to extend the lease with the Irvine Company, since it is too early to do so but the campus is committed to providing space for the Center going forward. Given the Center's vigorous research program, the campus intends to maintain its leased space as long as necessary, until permanent space can be provided on campus. If the Center stays where it is, UCI has committed to negotiate another lease. The long term plan is to construct a state-of-the-art building on campus to house the Center. For these reasons we have limited expenditure on the leased portion of space and chosen to invest in equipment that could be easily moved to a new on-campus facility. It is anticipated, however, that the leased space will be retained by the Center for use by investigators.

VIVARIUM ANNEX RENOVATION - PROJECT DESCRIPTION

Many of the studies conducted in the SRL are aimed at developing treatments for human conditions. The FDA requires testing in animal models prior to clinical trials. However, the SRL currently lacks a vivarium. We propose modest renovations to, and purchase of equipment for, a 1,788 sf vivarium committed by UCI Administration to this project. The space consists of rodent holding rooms and procedure rooms to test potential treatments in animal models. This will provide researchers using the SRL access to the facilities and equipment necessary for pre-clinical animal testing. We propose to create a secure entry to the facility by installing a pair of doors with card key locks in the corridor adjacent to the proposed facility (see Attachment B UCISRL Vivarium). We propose to convert an existing animal behavior room (Room 3) into a surgery room large enough to accommodate training classes, as well as renovate a small procedure room (Room 9) for necropsy, and carry out minor renovations to the



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Section B -- 1. Laboratory Renovation Plan (continued)

animal holding rooms including improvement of the lighting system. The specific modifications we propose are as follows: (1) install new doors with automatic operators at the entrance to the new facility (in the corridor between rooms 1 and 4) to ensure the security of the new facility, (2) provide lockers in the corridor between rooms 1 and 4 inside the facility for secure storage of personal items of personnel entering the facility, (3) provide a bench in the corridor inside the facility with storage below to enable personnel to change into disposable outerwear, (4) in the antechamber to rooms 1 and 2 add locked cabinets for storage of scientific equipment and supplies and provide rolling undercounter storage units for storage of investigator supplies, (5) install a wireless camera system in each behavior room (rooms 1 and 2) for monitoring behavioral experiments, (6) renovate room 3 (currently a behavior suite) to create a surgical suite for training and research by installing a biosafety cabinet for sterile handling of cells prior to transplantation, installing a sink cabinet for washing of instruments, hand washing etc., provide a 36" high epoxy lab bench top with drawer units below and locking cabinets above to provide laboratory bench space and storage, (7) provide supply and exhaust fan units to each animal holding room (rooms 4, 5, 6, 7 and 10) for attachment to cage racks and provide light timers to each animal holding room to upgrade the lighting system and (8) renovate one of the current necropsy rooms (room number 9) to install a downdraft necropsy table to allow safe handling of fixatives during histological procedures. In addition we propose to provide and install proximity readers to all doors to monitor and secure entry to each room, remove and replace epoxy flooring in all rooms and corridors and provide duplex electrical receptacles, where appropriate, to power newly purchased equipment. To equip the vivarium, we propose to purchase the following equipment:

(1) a whole animal imaging system: to allow transplanted cells to be visualized in living animals, (2) two mouse holding racks and cage setups: for holding animals for teaching, breeding and research, (4) two rat holding racks and cage setups: for teaching and research, (5) two animal changing stations: for handling animals in an specific pathogen free (SPF) environment during cage changing. This equipment will be used to facilitate the activities described above.

These renovations will result in the development of a state-of-the-art facility for use by investigators at UCI and UCR (as well as any eligible California institution) to learn and carry out animal survival surgery, cell transplantation, whole animal imaging and high-quality histology. These studies will ultimately be required before any stem cell-based therapy goes to clinical trial.

PROJECT MANAGEMENT AND TRACKING

UCI's Facilities Management Renovation Team will manage the vivarium renovations. This team is responsible for implementing laboratory renovations and other projects costing under \$5 million. Since this team was responsible for overseeing the design and construction of the Vivarium Annex building, its members are very familiar with the building's systems and layout. The assigned project manager, under the direction of the Manager of Project Services, is responsible for the management of the project throughout all phases, including design, bidding and construction. The Renovation Team also provides financial and contract management for the duration of the project. Change orders submitted by the contractor are reviewed by the project manager for compliance with the terms of the University's contract conditions to ensure that the contractor is entitled to the cost adjustment, and to ensure that pricing is within market rates. All change orders require final approval by the Assistant Vice Chancellor for Facilities Management.

IMPLEMENTATION AND SCHEDULE

The project will be implemented using a traditional design-bid-build delivery system. Upon award of the grant, UCI will select an executive architect to complete preliminary plans and working drawings. Preliminary plans are anticipated to take six weeks; working drawings, including required reviews and approvals, 10 weeks. Upon completion of working drawings, the project will be competitively bid, with the contract awarded to the lowest responsive bidder. The bid and contract award phases are anticipated to take seven weeks. Construction, including installation of fixed equipment, is scheduled for 11 weeks. Once the timing of renovations has been determined, movable equipment will be purchased so that it arrives at the appropriate time to be installed immediately upon completion of the renovations. Because some of the large pieces of equipment have long lead times for delivery we plan to determine delivery schedules as soon as the proposal is funded and order equipment accordingly. Space in the SRL can accommodate large pieces of equipment should some of it need to be stored pending completion of the renovated space.

COST CONTROL STRATEGIES

Same as information provided in SRL section above except that cost estimates will be prepared by a cost consultant.





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Section B. 1. Schedule/Timeline and Drawdown of Funds Table

Provide a realistic schedule and drawdown of funds for completing each activity/milestone, as indicated below.

#	Activity/Milestone	Start Date	Completion or Milestone Date	Amount of CIRM funds to be drawn
1	Grant Award (estimate)		Aug 1, 2007	
2	Request for Planning Funds (10% of Construction Costs)		Aug 1, 2007	\$ 84,284
3	Prepare Preliminary Plans	Aug 1, 2007	Sep 5, 2007	
4	Approval of PPs		Sep 12, 2007	
5	Prepare Working Drawings	Sep 12, 2007	Nov 7, 2007	
6	Approval of WDs		Nov 21, 2007	
7	Request Construction Contract funds (80% of Construction Costs)		Nov 21, 2007	\$674,272
8	Advertise for Construction Contract	Nov 28, 2007	Dec 19, 2007	
9	Award Construction Contract		Jan 16, 2008	
10	Construction Activities	Jan 16, 2008	Apr 2, 2008	
11	Completion of Equipment Purchases		Apr 2, 2008	
12	Request Equipment Purchase funds		Apr 2, 2008	\$999,874
13	Beneficial Occupancy		Apr 2, 2008	
14	Notice of Completion		Apr 16, 2008	
15	Request Construction Completion Amount (10% of Construction Funding)		Apr 2, 2008	\$ 84,284

"Preliminary Plans" (PPs) represent approximately 35 percent of the design effort, or may be considered the product of completing the "Design Development" (DDs) phase of architectural work.

"Working Drawings" (WDs) represent drawings and specifications from which a contractor may determine the full extent of work contemplated in the project for purposes of submitting a bid; may be referred to as completion of "Construction Documents" (CDs) phase of architectural work.



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Section B. 2. Budget

Provide a complete budget for the renovation that includes construction costs, design fees, administration of the project, other costs (i.e. installation of equipment) and a construction contingency (limited to 7-10% of the construction budget). Identify the amount of CIRM funds requested and the matching funds (construction requires 20% matching funds). Provide a complete budget for movable equipment (equipment requires 20% matching funds). (narrative limited to 3 pages)

(Note: An Excel spreadsheet can be attached as long as the total submission for this Section is limited to 3 pages)

The budget for the Vivarium Annex Renovation was developed by UCI's Facilities Management Renovations team, based on program input from the users at the Stem Cell Research Center and University Laboratory Animal Resources staff, and on cost information provided by an outside consultant. Costs for the Shared Research Laboratory Renovation was developed by Casco Contractors, based on program input from the users and on Casco's familiarity with the URP buildings and the costs associated with renovating them. (see Attachment B2 Budget Summary) Costs for both projects assume a construction start date of mid-January, 2008. Funding of the entire project cost is requested from CIRM; the required 20 percent match is being met with related prior construction and equipment costs incurred since January 2005.

Listed below is a chart detailing Shared Research Lab equipment. This equipment breakdown is grouped by (1) Shared Research Lab; (2) Vivarium

	NUMBER	UNIT COST	TOTAL COST
SHARED RESEARCH LAB EQUIPMENT			
(FACS) cell sorter	1	480,087.59	489,087.59
Amaza Nucleofector	1	9,592.00	9,592.00
Autoclave	1	11,000.00	11,000.00
Data storage server	1	10,000.00	10,000.00
UPS for -80c, incubators	2	8,155.59	16,311.18
Spectrophotometer	1	9,810.85	9,810.85
Nucleocounter	1	14,354.37	14,354.37
Gel Doc System	1	21,636.54	21,636.54
Axiovert Microscope	1	120,703.38	120,703.38
Dissecting scopes with fluorescence	1	22,049.56	22,049.56
6 ft. Hoods/Esco Biotech LA2-6A	1	6,869.06	6,869.06
Incubators/Sanyo MCO-36AIC-UV	1 pair	8,947.56	8,947.56
UPS for incubator	1	6,000.00	6,000.00
VIVARIUM EQUIPMENT			
Whole Animal Imaging	1	116,598.50	116,598.50
Mouse room racks and cages	2	35,654.28	71,308.56
Rat room racks and cages	2	28,963.02	57,926.04
Animal Changing Station	2	8,339.85	16,679.70
EQUIPMENT TOTAL:			999,873.89



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Section B. 3. Budget Summary Table

Complete the budget summary for the use of CIRM funds.

Note: All colored fields contain calculated data. Please do not enter anything in those fields.

Other Project Costs				
Budget Category		Total Budget	CIRM Grant Funds	Institutional Match
Construction Contract Costs		\$ 669,650	\$ 669,650	\$ 000
Other Construction Costs (institutional)		\$ 4,620	\$ 4,620	\$ 000
Subtotal Construction		\$ 674,270	\$ 674,270	\$ 000
Design Fees		\$ 45,900	\$ 45,900	\$ 000
Administrative Costs		\$ 55,240	\$ 55,240	\$ 000
Construction Contingency		\$ 67,430	\$ 67,430	\$ 000
Total Construction		\$ 842,840	\$ 842,840	\$ 000
Movable Equipment		\$ 999,874	\$ 999,874	
Total Budget		\$1,842,714	\$1,842,714	\$ 000
Gross Square Feet	3318	\$ 254.02	\$ 254.02	Const Costs/GSF
Assignable Square Feet	3318	\$ 254.02	\$ 254.02	Const Costs/ASF



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Section B. 4. Institutional Commitment

Provide a detailed description of the amount and source of matching funding for each request that requires matching funds. The requirement of matching funds can be satisfied if the institution can document funds, excluding other grant funds, committed to similar projects (i.e., renovation of lab space and equipment purchase) after January 1, 2005. Detail the use of the space after the three year period is completed. (narrative limited to 2 pages)

Over the past two years the Executive Vice Chancellor of the University has committed funds to the establishment of the Stem Cell Research Center with the intention that extramural funding would be acquired to support and continue the endeavors of the researchers and shared use of the facility. At this time the University is prepared to match CIRM funding with verifiable expenses of \$496,155.48 (Equipment: \$363,687; Tenant Improvement (renovations) \$61,041; Gifts-in-Kind (equipment): \$71,492) which exceeds the 20% requirement for all categories requested.

EQUIPMENT:

The University has appropriated funds for the initial outfit of the Stem Cell Research Center in order to attract promising investigators. The University has purchased equipment in excess of \$363,687.00. This equipment was purchased after January 2005 and was purchased using UCI Strategic Sourcing procedures, finding 'best pricing' and California vendors when available. Equipment Management has inventoried and tagged all equipment appropriate for stem cell usage. Equipment purchased that is being indicated for the purpose of matching funds includes: an Ultra TI-Sapphire Laser (\$177,972), Digital Imaging System (\$5,835), Axiovert Microscope (\$17,401) 3 Axiovert Microscopes (\$15,614 ea), 3 Incubators (\$9,383 ea), 4 Bio Safety Cabinets w /base (\$8,721 ea), Scientific Pharmaceutical Refrigerator (\$6,062), Power Supply System (\$6,142), 2 Water Purification Systems (\$6,053 and \$5,279), 2 Bio-Freezers (\$8,100 ea) and a Benchtop Incubator (\$12,913). All documentation is current and can be provided and will be reported via the UCI Cost Share system.

TENANT IMPROVEMENT:

The Stem Cell Research Center has been in its current location as of April 2006, on a lease that runs through March 31, 2009. Originally, the space provided was not entirely equipped for laboratory usage, therefore the University appropriated funding for minor repairs and accommodations needed to facilitate shared use and research. The University offers a portion of the previous renovation costs as Institutional Commitment in the amount of \$61,040.48 needed to fulfill the matching funds requirement. Renovation costs were expended and documented after January 2005 and include: \$43,246.52 for Data Cabling installation and \$17,793.96 for upgraded electrical capacity in order to accommodate supply and volt usage of larger laboratory equipment. The office of record for such documentation is the Stem Cell Research Center and will be reported via the UCI Cost Share system.

GIFT-IN KIND:

In addition to previously committed and expended University funds, The Center has received many generous gifts. A portion of these will be used in part as matching funds. Specifically equipment (gifts in kind) have been received on behalf of GPS Technologies and will be committed in the amount of \$71,492. Equipment was inventoried, evaluated, and a value was given to each piece by the campus' Equipment Management Department. All documentation for gifts-in-kind have been verified by UCI Foundation, the Stem Cell Research Center, Equipment Management and will be reported using the UCI Cost Share system. Items include; Centrifuge, Biological Safety Cabinet, and (2) CO2 Incubators, and each piece valued at \$17,857.00.

FACILITY COMMITMENT AFTER THE THREE YEAR PERIOD:

Given the SCRC's vigorous research program, the campus intends to maintain its leased space as long as necessary, until permanent space can be provided on campus. If after the three year period permanent space is acquired, the current facility will continue to be maintained for individual stem cell researchers and investigators. The renovations and usage of the vivarium will remain unchanged and continued to be utilized for stem cell researchers after the three year period as this space is occupied by permanent University space.



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Section C. Stem Cell Techniques Course (if applicable)

Based on the information provided in Part One of the application describing the course, include a justification of the additional space required and additional equipment requested, if any. Include additional square footage and provide as an attachment one 11x17 page of the proposed floor plan of the renovated space. (narrative limited to 1 page)

The SRL currently occupies about 25% of the Sue and Bill Gross Stem Cell Research Center and consists of 2 tissue culture rooms (550 total sf), an embryo culture/hESC derivation room (200 sf), a flow cytometry room with a BD Flow cytometer (150 sf), an imaging room with a Zeiss Two-photon confocal microscope (300 sf), a cryostorage room (250 sf), and general lab space with standard lab benches (1,100 sf). Next to the SRL is a lecture room capable of accommodating 15 people, a small meeting room, and a small reception area. Here we propose to purchase specific pieces of equipment in order to maintain and expand the training efforts of the SRL in a federal funding-free environment.

TISSUE CULTURE: Current SRL space is used heavily by PIs, the hESC Emphasis Track of the UCI Masters Program in Biotechnology, and the UCI hESC Techniques Course. Our first offering of the hESC Techniques Course held in September 2006, included 24 students and used all the SRL tissue culture rooms. Since September, the number of investigators using the SRL has increased dramatically. Consequently, only 1 tissue culture room was available for our second offering of the course in March 2007 and participation was limited to 8 students. The result is a long waiting list and a significant delay in accommodating interested researchers in training. Here we propose to expand into 1000 sf of available space adjacent to the existing SRL. To equip this space for training we propose to purchase 3 tissue culture hoods, 6 tissue culture incubators, 3 refrigerators, 3 freezers and an inverted fluorescence microscope with digital camera and display for teaching purposes. This will allow us to continue and expand our quarterly hESC Techniques Course and to teach the yearly Stem Cell Emphasis Track of the Master's Course in Biotechnology. In addition, we propose to increase UCI's training capacity through purchase of a videoconferencing system that would connect us to trainees, collaborators and other training institutes easily. This will require minor renovations and the purchase of a Videoconferencing System at relatively small cost. The system we have chosen will allow transmission and reception of data and, at the same time, lectures (in a variety of formats for compatibility), and allow questions to be asked from external sites. In addition, the system will allow recording of videoconferences for subsequent web casting to enable teaching material to be easily placed on and obtained through the Stem Cell Research Center website.

A detailed list of proposed equipment purchases to enhance the Shared Research Laboratory capability to conduct the Stem Cell Techniques Course is presented in (Attachment C2CourseEquipment) and also described here: (1) three 6-foot tissue culture hoods for safe-handling and routine passaging of hESC lines and their differentiated derivatives, (2) three pairs of tissue culture incubators for maintenance of hESC lines, (3) UPS backup power units to maintain incubators in the event of a power outage, (4) UPS backup power units to maintain existing -80C freezers in the event of a power failure, (5) an Inverted Microscope with digital camera and screen for teaching hESC culture and tissue histology to classes, (6) a wax-embedding station to teach students how to prepare tissues for histological analysis (7) a microtome for teaching students how to prepare histological sections for histochemical and immunocytochemical analysis of tissues and hESC-derived teratomas, (8) a cryostat for teaching techniques of frozen section preparation for histological and immunocytochemical analysis and (9) a videoconferencing station: to send and receive training lectures and seminars to and from other institutions as well as to record teaching material for placement on the website.

VIVARIUM: Many of the studies conducted in the SRL are aimed at developing treatments for human conditions. The FDA requires testing in animal models prior to clinical trials. The SRL currently lacks a vivarium. We propose to expand our training activities to include teaching investigators how to carry out testing in pre-clinical models. This course will be modeled on the highly-successful Reeve-Irvine Spinal Cord Injury Techniques Course that has been held since 2000 and has trained over 100 students. To do this, we propose to equip a small amount of vivarium space consisting of rodent holding rooms and procedure rooms to teach survival surgery, cell transplantation and whole animal imaging to enable training in, and testing of, potential cell-based treatments in animal models. This will enable researchers using the SRL to learn how to complete studies that need to be tested in animal models. To equip the vivarium for training purposes we propose to purchase: (1) a small animal stereotaxic instrument: to facilitate teaching stereotaxic placement of electrodes, micropipettes, cannula and other devices, (2) three dissecting microscopes: for teaching surgical techniques, (3) two dissecting microscopes: for teaching embryo handling for hESC derivation, (4) a tissue culture hood: for handling of cells in a sterile environment prior to transplantation during the training courses, (5) a small animal anesthesia system: to demonstrate and perform certain types of small animal survival surgery and procedures, (6) a computer work station: to store investigator generated data and provide teaching material in the vivarium suite, (7) three animal changing stations: to handle animals outside of their cages in a specific pathogen-free environment, (8) three mouse cage racks and cages for breeding and holding animals for teaching purposes and (9) two rat racks and cages for holding animals for teaching purposes. The equipment proposed for purchase will enhance our ability to train investigators from UCI and UCR (as well as any investigators from eligible California institutions) in hESC culture and to take the next steps towards pre-clinical modeling for the development of cell-based therapies for human diseases and disorders. +

Limit narrative to visible field area.



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Section C. 1. Schedule and Drawdown of Funds Table (if applicable)

Provide a realistic schedule and drawdown of funds for completing each activity/milestone, as indicated below.

#	Activity/Milestone	Start Date	Completion or Milestone Date	Amount of CIRM funds to be drawn
1	Grant Award (estimate)			
2	Request for Planning Funds (10% of Construction Costs)			\$ 000
3	Prepare Preliminary Plans			
4	Approval of PPs			
5	Prepare Working Drawings			
6	Approval of WDs			
7	Request Construction Contract funds (80% of Construction Costs)			\$ 000
8	Advertise for Construction Contract			
9	Award Construction Contract			
10	Construction Activities			
11	Completion of Additional Equipment Purchases		Apr 2, 2008	
12	Request Additional Equipment Purchase funds		Apr 2, 2008	\$499,265
13	Beneficial Occupancy			
14	Notice of Completion			
15	Request Construction Completion Amount (10% of Construction Funding)			\$ 000

"Preliminary Plans" (PPs) represent approximately 35 percent of the design effort, or may be considered the product of completing the "Design Development" (DDs) phase of architectural work.

"Working Drawings" (WDs) represent drawings and specifications from which a contractor may determine the full extent of work contemplated in the project for purposes of submitting a bid; may be referred to as completion of "Construction Documents" (CDs) phase of architectural work.

"Additional Equipment" represents equipment to be used for the Stem Cell Techniques Course.



CIRM Shared Research Laboratory Information Form – Part Two

Section C. 2. Budget (if applicable)

Provide a complete budget for the additional renovation that includes construction costs, design fees, administration of the project, other costs (i.e. installation of equipment) and a construction contingency (limited to 7-10% of the construction budget). Identify the amount of CIRM funds requested and the matching funds (construction requires 20% matching funds). Provide a complete budget for additional movable equipment (equipment requires 20% matching funds). **(narrative limited to 3 pages)**

(Note: An Excel spreadsheet can be attached as long as the total submission for this Section is limited to 3 pages)

No renovation costs have been requested for the Stem Cell Techniques Course portion of the proposal. Attached is a spreadsheet (see Attachment C2 Course Equipment) which details the specific equipment being requested and which itemizes costs. This equipment will further support our mission to train scientists and technical staff in the growth and maintenance of hESCs and culture techniques.



CIRM Shared Research Laboratory Information Form – Part Two

Section C. 3. Budget Summary Table (if applicable)

Complete the budget summary for the use of CIRM funds.

Note: All colored fields contain calculated data. Please do not enter anything in those fields.

Other Project Costs				
Budget Category		Total Budget	CIRM Grant Funds	Institutional Match
Construction Contract Costs				
Other Construction Costs (institutional)				
Subtotal Construction				
Design Fees				
Administrative Costs				
Construction Contingency				
Total Construction				
Additional Movable Equipment		\$ 499,265	\$ 499,265	\$ 000
Total Budget		\$ 499,265	\$ 499,265	\$ 000
Gross Square Feet		\$ 0.00	\$ 0.00	Const Costs/GSF
Assignable Square Feet		\$ 0.00	\$ 0.00	Const Costs/ASF



CIRM Shared Research Laboratory Information Form – Part Two

Section D. Signature Page

Complete, save, and print Part Two of the Shared Research Laboratory Grant Information.

Submit electronic application as an email attachment to laboratory@cirm.ca.gov no later than 5:00pm PST on March 16, 2007.

Mail* the original executed Part Two application and five (5) copies to:

Shared Research Laboratory Grant Application

California Institute for Regenerative Medicine

210 King Street

San Francisco, CA 94107

***Mailing must be postmarked no later than March 16, 2007.**

Applications will not be accepted after these deadlines.

Project Start Date Aug 1, 2007

Construction Start Date Jan 16, 2008

Occupancy Date Apr 2, 2008

Total Part Two Funds Requested for Shared Laboratory Space \$1,842,714

Total Part Two Funds Requested for Stem Cell Techniques Course \$ 499,265

Total Capital Funds Requested \$ 842,840

Facilities Contact

Ms. Janet C. Mason
Director
Capital Planning
University of California, Irvine
750 University Tower
Irvine, CA 926974535
(949) 824-7668
jcmason@uci.edu

Authorized Organizational Official

Date

Print Name

Title

Program Director

Date

Print Name

Title



CIRM Shared Research Laboratory Information Form – Part Two Supplement

Project Information

Application Number CL1-00520-1

Program Director Name: Peter Donovan

Historical Performance

Provide information on past performance for 3 projects.

	Project 1	Project 2	Project 3
Brief Project Title	Med Sci A Annex	McGaugh Hall/Steinhaus Hall	Med Surge II Lab Reno
Original Budget (Total project cost)	\$4,990,000	\$ 523,000	\$ 682,564
Final project cost	\$4,990,000	\$ 523,000	\$ 677,700
Scheduled Completion Date	Oct 7, 2005	Sep 23, 2004	Sep 6, 2006
Actual Notice of Completion Date	Oct 22, 2005	Sep 30, 2004	Oct 6, 2006
Gross Square Feet involved	9,076	2,000	5,800
Assignable Square Feet involved	6,053	2,000	5,800
Approximate number of change orders	7	2	5
Value of all change orders & claims	\$ 321,577	\$ 16,323	\$ 12,634
Type of construction management	Design-Bid-Build	Design-Bid-Build	Design-Bid-Build

Laboratory Alteration Projects

Please enter the number of laboratory alteration projects completed by the applicant in the past 2 years (in the range of \$1-5 million in project cost), and the approximate total dollar value that these projects represent.

Total Laboratory Alteration Projects

1

Approximate Total Value

\$1,193,763

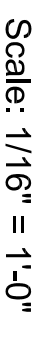
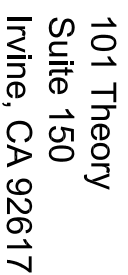
Limit Budget Justification to visible field area.

CIRM SHARED RESEARCH LABORATORY GRANT
SECTION B.2.
BUDGET SUMMARY

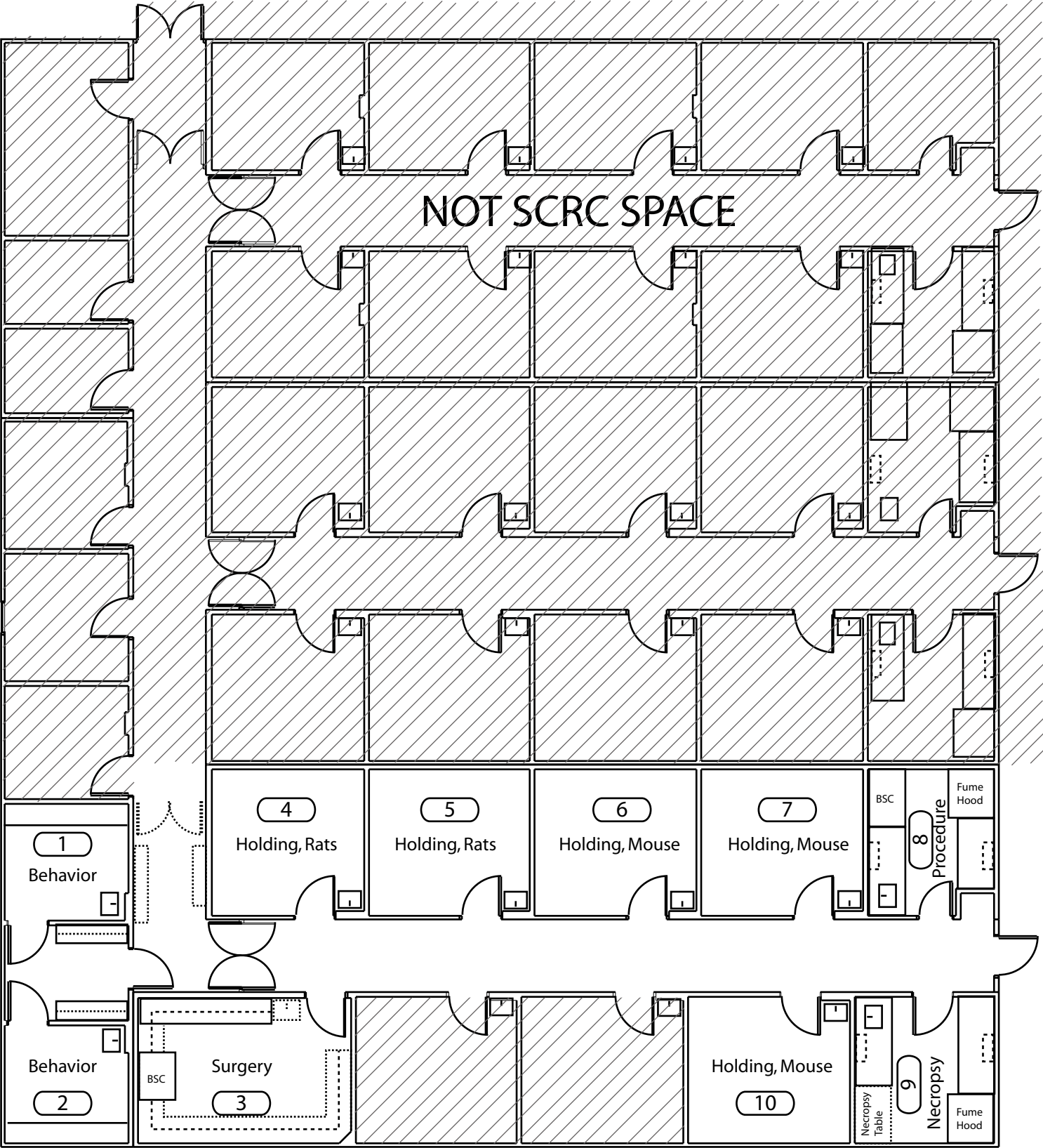
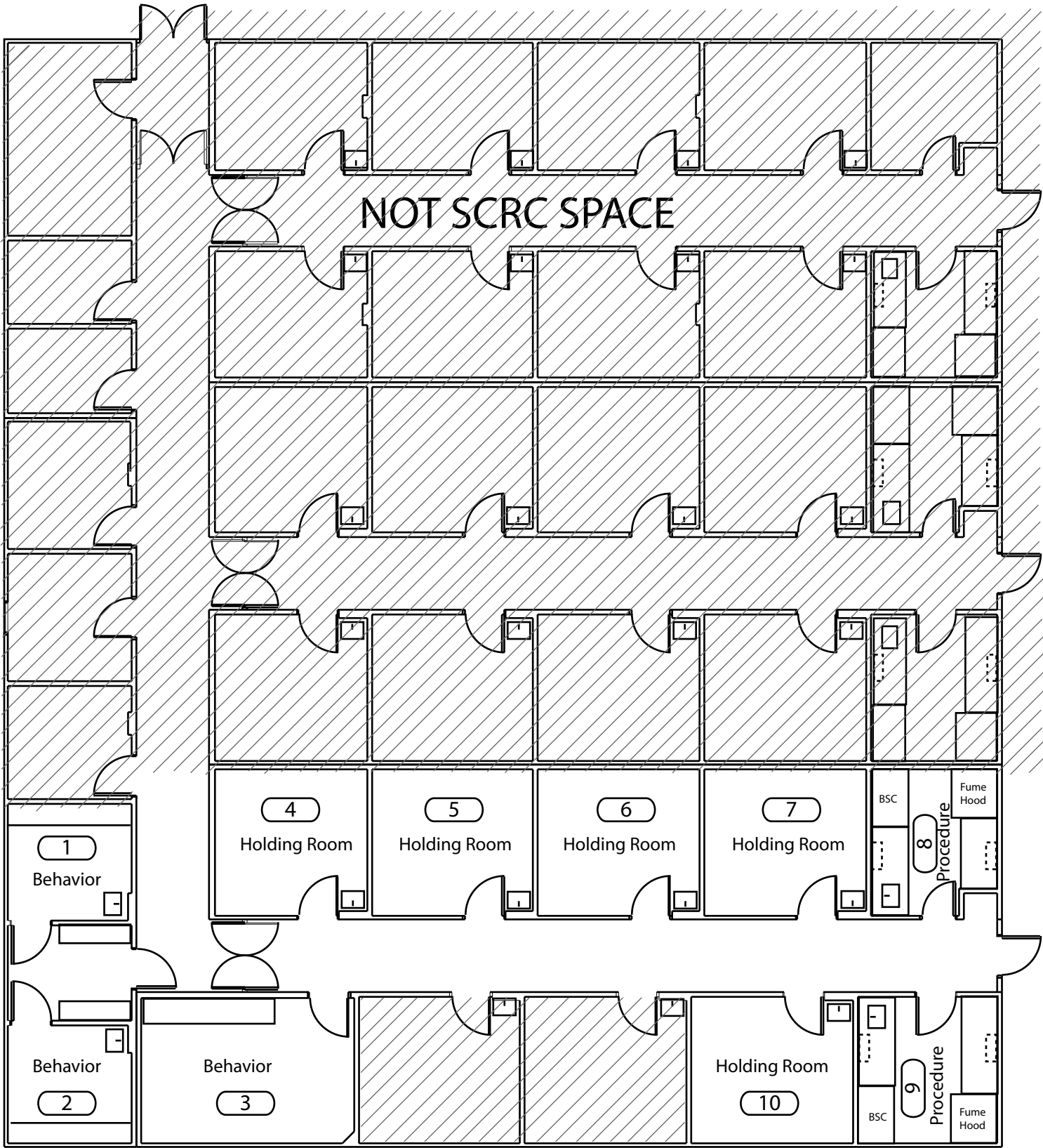
	Estimated Cost
<u>CONSTRUCTION COSTS - VIVARIUM ANNEX RENOVATION</u>	
Casework	\$95,870
Rm 1018B: F/I (2) cabinets	
Rm 1018A: F/I (2) cabinets	
Rm 1041: F/I Base cabinets w/epoxy tops, wire mold, upper wall cabinets. 36" base	
Rm 1049: Disconnect BSC hood	
Corridor 1901 F/I bench w/ storage below and lockers (9 lf)	
Furnish and Install Necropsy table in Room 1049 (allowance)	\$29,700
Security	\$35,110
Provide proximity readers at all doors (15 total)	
Doors and hardware	\$13,460
Install new pair of doors/hardware at corridor 1901	
14 ga hm doors, 20 min rated, w/view windows, in 14 ga hm frames	
Provide automatic operator at doors	
Electrical	\$14,200
Replace light timers at 5 holding rooms	
Flooring	\$107,920
Modifications to epoxy flooring	
HVAC modifications	\$73,260
F/I supply and exhaust for holding rooms	
Subtotal - Construction	\$369,520
General Conditions	\$44,340
Overhead and Profit	\$55,430
Total - Construction Contract Costs	\$469,290
UCI Facilities Management Shop Support	\$4,620
Total - Vivarium Renovation	\$473,910
<u>CONSTRUCTION COSTS - SHARED LABORATORY RENOVATION</u>	
Demolition	\$6,830
Demolish existing walls, Room 104	
Demo carpet	
Demo soffit, room 113	
Remove existing pass-through window, room 118	
Remove sink, room 120	
Millwork	\$14,980
Counters and other millwork, rooms 119, 123A, 123B, 125, 128	
Metal Framing and Drywall	\$14,990
Provide new wall, room 114	
Provide patching at demo walls	
Provide new wall at office 100A	
Doors/Frames and Hardware	\$9,420
(4) new building standard doors, rooms 100A, 103, 114, 128	
Acoustical Ceiling	\$5,650
Remove and replace ceiling tile for access	
Provide and install new ceiling tile at training room 119	
Glass/Glazing	\$820
New sidelight glazing, rooms 103, 128	
Fire Sprinklers	\$5,040
Provide new and relocate fire sprinklers for new offices as required by city code	
Plumbing	\$7,790

New sink, room 120	
Electrical	\$40,170
(18) 2x4 light fixtures, rooms 119, 120, 125, 128	
(13) dedicated receptacles, rooms 119, 120, 123A, 123B, 125, 128, 129	
(7) UPS circuits, rooms 119, 120, 123A, 123B, 125, 128, 129	
(2) exhaust fans, rooms 117, 118	
(2) thermostats, rooms 117, 118	
(5) HEPA circuits, rooms 119, 121, 125, 128, 129	
Reswitch all lighting	
HVAC	\$54,540
Provide ductwork and registers to new offices	
Provide ductwork and registers in offices where missing, room 118	
New HEPA filter, room 119, 125, 128, 129	
Exhaust fans, rooms 117, 118	
Air balance	
Painting and Wallcovering	\$4,620
Paint walls affected by construction only	
Finish new doors and frames	
Flooring	\$5,580
Provide new base at walls	
Provide new finishes in conference room 104	
Patch at demo'd walls	
Demo and replace	
Clean-up and Protection	\$2,780
Subtotal - Construction	\$173,210
General Conditions	\$17,310
Overhead and Profit	\$14,460
Total - Shared Laboratory Construction	\$204,980
<hr/>	
TOTAL CONSTRUCTION - VIVARIUM AND SHARED LABORATORY	\$674,270
<hr/>	
DESIGN FEES	\$45,900
ADMINISTRATIVE COSTS	\$55,240
Project Management/Contract Admin	
Fire Marshal/EH&S review (Vivarium)	
City of Irvine Plan Check/Permits (Shared Laboratory)	
 CONSTRUCTION CONTINGENCY	 \$67,430
<hr/>	
TOTAL - DESIGN AND CONSTRUCTION COSTS	\$842,840

Application Number: CL1-00520-1



UCI Shared Research Facility Renovations - Vivarium
Application Number: CL1-00520-1



SECTION C.2 BUDGET - COURSE EQUIPMENT

<i>Shared Research Lab</i>			
	Number	Unit cost	Total cost
6ft Hoods/Esco Biotech LA2-6A	3	6,869.06	20,607.18
Incubators/Sanyo MCO-36AIC-UV	3 pair	8,947.56	26,842.68
UPS for Incubator	1	6,000.00	6,000.00
UPS for -80 freezers	1	8,155.59	8,155.59
Inverted Microscope w/video & camera	1	70,498.27	70,498.27
Embedding Station	1	10,717.02	10,717.02
Microtome	1	15,000.00	15,000.00
Cryostat	1	31,000.00	31,000.00
Video Conferencing System	1	37,454.36	37,454.36
<i>Vivarium</i>			
	Number	Unit cost	Total cost
Stereotaxic rig	1	10,575.66	10,575.66
Dissecting scope for teaching surgery	3	12,162.28	36,486.84
Dissecting scope for embryos	2	5,537.27	11,074.54
4 ft tissue culture hood	1	5,414.43	5,414.43
Small Animal Anesthesia System	1	14,263.18	14,263.18
Computer Work Station	1	5,266.62	5,266.82
Animal Changing Station	3	8,339.85	25,019.55
Mouse racks and cages	3	35,654.28	106,962.84
Rat racks and cages	2	28,963.02	57,926.04

Equipment Total 499,265.00

Appendix A

Application: CL1-00520-1

Title: The University of California: Irvine Regional Human Embryonic Stem Cell Shared Research Laboratory and Stem Cell Techniques Course

Public Abstract:

A major goal of the Shared Research Laboratory (SRL) is to foster the development of new treatments for human diseases and disorders by serving as a leading regional center for human embryonic stem cell (hESC) research, clinical applications, and training. A critical component of this vision is a full service SRL. The SRL will provide space and equipment that is free of federal funding to allow pursuit of any study needed to discover the basic properties of hESCs, to understand disease processes, to accelerate drug development and to develop cell-based therapeutics. The research in the SRL includes a balance of studies into the basic biology of hESCs, disease mechanisms, and potential therapeutics. Results of these studies will increase our understanding of the causes and potential treatments of spinal cord injury, retinal disease, motoneuron diseases, Huntington's disease, diabetes, multiple sclerosis, muscular dystrophy, heart disease, and Alzheimer's disease. The SRL also hosts a hESC Techniques Course. This 5-day, intensive, hands-on course trains future stem cell researchers in techniques for cultivation, handling and differentiation of hESCs. We propose to develop new space for pre-clinical testing, to obtain key pieces of major equipment, and to support personnel in order to improve our ability to develop new FDA-compliant treatments for human diseases and disorders. The new space will allow us to expand our training effort to include procedures needed to conduct pre-clinical translational and transplantation projects. The expanded curriculum will include animal survival surgery, cell transplantation techniques, and methods for tracing transplanted cells in the animal. Currently few, if any, venues exist in which researchers can learn not only how to create potential hESC therapeutics, but also learn how to test potential treatments in animal models. Importantly, all treatment-oriented research will be done under strict FDA quality assurance guidelines, so researchers will not have to repeat experiments when they file with the FDA, streamlining processes and decreasing time to clinical trial. The research expertise and institutional support for hESCs puts us in a strong position to serve as a regional facility of excellence, bringing new researchers into the field, and leading the way toward realizing the potential of hESCs in treating human conditions.

Our institution is exceptionally strong in translating basic scientific discoveries to the clinic, and in particular, has FDA-compliant pre-clinical strength in translation of hESC discoveries. Indeed, preclinical studies undertaken through the SRL will be conducted under the guidance of existing Regulatory Quality Assurance Officers to ensure FDA-compliance. With the proposed additions to the SRL, our vision of serving as a regional resource for hESC research and training will bring us closer to hESC-based treatments.

Statement of Benefit to California:

Proposition 71's primary goal is to translate basic research to clinical applications. Our program is exceptionally strong in moving basic scientific discoveries to the clinic and has FDA-compliant pre-clinical strength in translation of hESC discoveries.

The disability and loss of earning power and personal freedom resulting from a disease or disorder are devastating and create a financial burden for California. Therapies using human embryonic stem cells (hESCs) have the potential to change the lives of millions, and hESCs as models of diseases will help us understand the underlying causes of disease. For the potential of hESCs to be realized, California researchers need the equipment, lab space, and personnel to develop hESCs into viable treatments. Shared research laboratories (SRL) allow researchers to access critical, expensive equipment and concentrate expertise under one roof providing a favorable environment for collaboration. The federal constraints on hESCs create a critical need for SRL equipped and staffed with non-federal funds.

Our SRL is a regional resource currently used by scientists from 4 institutions, and hosts the quarterly hESC Techniques Course. Additional investment will result in a full service regional SRL where researchers can derive new hESC lines, develop cell-based treatments, and test potential therapeutics in animal models. Anticipated benefits of our SRL to the citizens of California include: 1) development of new cell-based treatments for a variety of human diseases and disorders; 2) improved methods for understanding normal development and the environmental risks to the early embryo; 3) development of intellectual property that could form the basis of new biotech startup companies; and 4) improved methods for drug development that could directly benefit citizens of the state. With the proposed additions, our vision of serving as a regional resource for hESC research and training will bring us closer to hESC-based treatments.